

What is claimed is:

1. A cleaning method of cleaning a thermal head having a heating element array in which plural heating elements are arranged linearly, and said heating element array heating a thermal recording material in feeding and printing an image on a recording area, said cleaning method comprising the steps of;
contacting said heating element array with an outside of said recording area;
causing said heating element array to generate heat at cleaning temperature that is insufficient for said thermal recording material to develop color; and
feeding said thermal recording material by a predetermined distance through between said heating element array and a platen, wherein said heating element array is cleaned by use of said thermal recording material.
2. A cleaning method as claimed in claim 1, wherein said thermal recording material includes plural thermosensitive coloring layers developing different colors, and said thermosensitive coloring layers are colored for printing in a frame sequential fashion.
3. A cleaning method as claimed in claim 2, wherein said plural thermosensitive coloring layers are respectively at least yellow, magenta and cyan thermosensitive coloring layers which are stacked sequentially on a printing surface of said thermal recording material;

said yellow thermosensitive coloring layer having the highest heat sensitivity develops yellow color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a first wave-length range;

5 said magenta thermosensitive coloring layer of which heat sensitivity is middle develops magenta color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a second wave-length range; and

10 said cyan thermosensitive coloring layer having the lowest heat sensitivity develops cyan color by application of heat.

4. A cleaning method as claimed in claim 3, wherein said cleaning temperature is determined so that said cyan thermosensitive coloring layer will not develop said cyan
15 color.

5. A cleaning method as claimed in claim 4, wherein said thermal recording material further includes a protective layer overlaid on said yellow thermosensitive coloring layer, said
20 cleaning temperature is substantially lower than intermediate temperature at a median level between temperature for softening said protective layer and temperature for developing said cyan thermosensitive coloring layer to the highest density.

25 6. A cleaning method as claimed in claim 5, wherein said steps for cleaning are executed after recording of said cyan thermosensitive coloring layer.

7. A cleaning method as claimed in claim 5, wherein said thermal recording material is wound to a paper roll, said image is printed on said recording area after said thermal recording material has been drawn from said paper roll, and said recording
5 area in which said image has been recorded is cut away.

8. A cleaning method as claimed in claim 7, wherein said steps for cleaning are executed by using a cleaning portion of said thermal recording material between said recording area in which
10 said image has been recorded and a next recording area in which said image is not recorded.

9. A cleaning method as claimed in claim 8, wherein said cleaning portion used for said cleaning is cut away and then
15 discarded.

10. A cleaning method as claimed in claim 7, wherein when a power source is turned off, power-off operation is performed for rewinding said thermal recording material to said paper roll,
20 and when the power source is turned on, power-on operation is performed for drawing said thermal recording material from said paper roll.

11. A cleaning method as claimed in claim 10, wherein said
25 steps for cleaning are executed after said power-on operation, if said power-off operation has not been normally completed.

12. A cleaning method as claimed in claim 10, wherein if said

power-off operation has been normally completed, said image is started to be printed on said recording area after preheating of said heating element array, and if said power-off operation has not been normally completed, said image is started to be
5 printed on said recording area without preheating said heating element array.

13. A cleaning method as claimed in claim 10, wherein said steps for cleaning are executed after said heating element array
10 and said platen have been contacted with each other according to initializing operation for restoring an initial state of said thermal head, or after resetting of error, or after exchanging of said thermal recording material.

15 14. A cleaning method as claimed in claim 10, wherein in case of a normal printing operation, said image is started to be printed on said recording area after preheating of said thermal heating array; and

after said heating element array and said platen have been
20 contacted with each other according to said initializing operation for restoring the initial state of said thermal head, or after resetting of the error, or after exchanging of said thermal recording material, said image is started to be printed on said recording area without preheating of said thermal
25 heating array.

15. A thermal printer having a thermal head, said thermal head having a heating element array in which plural heating

elements are arranged linearly, said heating element array heating a thermal recording material which is held by a platen and printing an image on a recording area, said thermal recording material being rewound to a paper roll in accordance
5 with a power-off operation, and drawn from said paper roll in accordance with a power-on operation, said thermal printer comprising:

checking means for checking whether said power-off operation has been normally completed; and

10 a termination state memory for storing a termination state of said power-off operation transmitted from said checking means;

a controller for performing cleaning of said thermal head when said power-off operation has not been normally completed
15 in reference to said termination state memory during said power-on operation, and when printing on said recording area has been completed, said cleaning including steps of:

- (A) pressing said heating element array against an outside of said recording area;
- 20 (B) causing said heating element array to generate heat at cleaning temperature that is insufficient for said thermal recording material to develop color; and
- (C) feeding said thermal recording material by a
25 predetermined distance through between said heating element array and said platen, said heating element array being cleaned by use of said thermal recording material.

16. A thermal printer as claimed in claim 15, wherein said thermal recording material includes at least yellow, magenta, and cyan thermosensitive coloring layers which are stacked sequentially on a printing surface of said thermal recording material;

said yellow thermosensitive coloring layer having the highest heat sensitivity develops yellow color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a first wave-length range;

said magenta thermosensitive coloring layer of which heat sensitivity is middle develops magenta color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a second wave-length range; and

said cyan thermosensitive coloring layer having the lowest heat sensitivity develops cyan color by application of heat.

17. A thermal printer as claimed in claim 16, wherein said thermal recording material further includes a protective layer overlaid on said yellow thermosensitive coloring layer, said cleaning temperature is substantially lower than intermediate temperature at a median level between temperature for softening said protective layer and temperature for developing said cyan thermosensitive coloring layer to the highest density.

18. A thermal printer having a thermal head, said thermal head having a heating element array in which plural heating elements are arranged linearly, said heating element array

heating a thermal recording material which is held by a platen and printing an image on a recording area, said thermal recording material being rewound to a paper roll in accordance with a power-off operation, and drawn from said paper roll in accordance with a power-on operation, said thermal printer
5 comprising:

a controller for performing cleaning of said thermal head after printing on said recording area has been completed, said cleaning including steps of;

- 10 (A) pressing said heating element array against an outside of said recording area;
- (B) causing said heating element array to generate heat at cleaning temperature that is insufficient for said thermal recording material to develop color;
- 15 and
- (C) feeding said thermal recording material by a predetermined distance through between said heating element array and said platen, said heating element array being cleaned by use of said thermal recording
20 material;

checking means for checking whether said power-off operation has been normally completed; and

a termination state memory for storing a termination state of said power-off operation transmitted from said checking
25 means;

wherein said controller further judges whether preheating of said thermal head should be executed by referring to said termination state memory, and executes said preheating prior

to printing on said recording area if said power-off operation has been normally completed, and suppresses said preheating if said power-off operation has not been normally completed.

5 19. A thermal printer as claimed in claim 18, wherein said thermal recording material includes at least yellow, magenta, and cyan thermosensitive coloring layers which are stacked sequentially on a printing surface of said thermal recording material;

10 said yellow thermosensitive coloring layer having the highest heat sensitivity develops yellow color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a first wave-length range;

15 said magenta thermosensitive coloring layer of which heat sensitivity is middle develops magenta color by application of heat, and has a fixing property responsive to electro-magnetic radiations having a second wave-length ranges; and

20 said cyan thermosensitive coloring layer having the lowest heat sensitivity develops cyan color by application of heat.

25 20. A thermal printer as claimed in claim 19, wherein said thermal recording material further includes a protective layer overlaid on said yellow thermosensitive coloring layer, said cleaning temperature is substantially lower than intermediate temperature at a median level between temperature for softening said protective layer and temperature for developing said cyan thermosensitive coloring layer to the highest density.